

What is claimed is:

Sub C<sub>1</sub>  
1. A recombinant human iduronate 2-sulfatase (IDS) or or fragment thereof retaining enzymatic activity wherein said recombinant IDS is more highly glycosylated than the naturally occurring enzyme isolated from human tissue and wherein said recombinant human IDS or fragment thereof is produced in Chinese Hamster Ovary (CHO) cells.

2. The recombinant IDS according to Claim 1 having a molecular weight in the range of from about 70k Da to about 90 kDa as determined using SDS/PAGE.

Sub C<sub>2</sub>  
3. A pharmaceutical composition useful for treating patients suffering from a deficiency in iduronate 2-sulfatase (IDS) comprising one or more pharmaceutically acceptable carriers or diluents and a recombinant human IDS or an enzymatically active fragment thereof wherein said recombinant human IDS or enzymatically active fragment thereof is produced in Chinese Hamster Ovary (CHO) cells and is more highly glycosylated than the naturally occurring enzyme isolated from human tissue.

4. The pharmaceutical composition of Claim 3 wherein said recombinant human IDS produced in Chinese Hamster Ovary (CHO) cells has a molecular weight in the range of from about 70k Da to about 90 kDa as determined using SDS/PAGE.

Sub C<sub>3</sub>  
5. A recombinant human iduronate 2-sulfatase (IDS) having the sequence of SEQ ID NO:1 produced in Chinese Hamster Ovary (CHO) cells wherein said recombinant IDS has a longer half-life than native IDS produced by human liver cells.

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Sub C3  
6. A recombinant human iduronate 2-sulfatase (IDS) having the sequence of SEQ ID NO:1 produced in Chinese Hamster Ovary (CHO) cells wherein said recombinant IDS is taken up by mucopolysaccharidosis cells to a greater degree than native IDS produced by human liver cells.

7. A method for treating a patient suffering from iduronate 2-sulfatase (IDS) deficiency, said method comprising administering to said patient an effective amount of a recombinant human IDS which is more highly glycosylated than the naturally occurring enzyme and wherein said recombinant human IDS is produced in Chinese Hamster Ovary (CHO) cells.

8. A method for producing a recombinant human iduronate 2-sulfatase (IDS) which is more highly glycosylated than the naturally occurring enzyme which comprises culturing a Chinese Hamster Ovary (CHO) cell comprising a nucleic acid encoding an enzymatically active IDS polypeptide wherein said CHO cell glycosylates said polypeptide to a greater degree than a native IDS polypeptide expressed by a natural human liver cell.

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